

June 1999

## **CURRICULUM VITAE**

**NAME:** PAUL EDWARD SMITH

**ORGANIZATION:** National Oceanic and Atmospheric Administration  
National Marine Fisheries Service  
Southwest Fisheries Science Center  
P. O. Box 271  
La Jolla, California 92038  
(858) 546-7169

**PRESENT POSITION:** Supervisory Fishery Biologist (Research)  
Leader of Survey Systems

**DISCIPLINE:** Pelagic Ecology

**EDUCATION:** Ph.D., Zoology, University of Iowa, 1962

**EXPERIENCE:**

1963 - Present	Research Fisheries Biologist National Marine Fisheries Service La Jolla, CA
1962 - 1963	Sverdrup Post-Doctoral Fellow Scripps Institution of Oceanography La Jolla, CA
1958 - 1962	Teaching Assistant Department of Zoology University of Iowa Iowa City, IA
1956 - 1958	Science Teacher Middle School Forest City, IA
1953 - 1955	Corporal U.S. Army Ft. Lawton, WA



## RESEARCH INTERESTS:

Designing, Testing, Deploying pelagic sampling systems for describing, the structure, distribution and abundance of ichthyoplankton and juvenile fishes. Using abundance and rates of change of planktonic stages of fish to erect population life tables.

## HONORS AND AWARDS:

Department of Commerce Gold Medal, 1990  
Sverdrup Post-Doctoral Fellowship, 1962  
National Science Foundation Fellow 1962

## PROFESSIONAL AFFILIATIONS:

Ecological Society of America  
American Society of Limnology and Oceanography  
American Society of Naturalists

## SERVICE ON SCIENTIFIC COMMITTEES:

### Student

1999 Yanira Green	Chair, CICESE, Ensenada
1999 Eva Coterio	Committee, CICESE, Ensenada
1999 Shannon Cass-Calay	Committee, UCSD, Scripps Institution of Oceanography
1999 Paul Dixon	Committee, UCSD, Scripps Institution of Oceanography
1999 Scott Rumsey	Committee, UCSD, Scripps Institution of Oceanography
PhD 1997 Elizabeth A. Logerwell	Committee, U.C., Irvine
PhD 1997 Karin A. Forney	Committee, UCSD, Scripps Institution of Oceanography
PhD 1997 Sue E. Moore	Co-Chair, UCSD, Scripps Institution of Oceanography
PhD 1996 Michael G. Hinton	Co-Chair, UCSD, Scripps Institution of Oceanography
MSc 1996 Michele L. G. Lyons	Committee, UCSD, Scripps Institution of Oceanography
PhD 1995 Miguel A. Cisneros	Committee, U.C., Davis
PhD 1994 David A. Demer	Committee, UCSD, Scripps Institution of Oceanography
PhD 1994 Denzil G. M. Miller	External Committee, University of Cape Town
MSc 1994 Lynne J. Shannon	External Committee, University of Cape Town
PhD 1993 Debra L. Palka	Committee, UCSD, Scripps Institution of Oceanography
MSc 1990 Carlos A. Villacastin-Herrero	External Committee, University of Cape Town
PhD 1986 Peter A. Shelton	External Committee, University of Cape Town
MSc 1986 Juan Felix Elorduy Garay	Director, CICESE, Ecologia Marina Ensenada
PhD 1985 Ross Shotton	External Committee, Dalhousie University, Nova Scotia
PhD 1984 M. Elizabeth Clarke	Committee, UCSD, Scripps Institution of Oceanography
PhD 1982 Paul C. Fiedler	Committee, UCSD Scripps Institution of Oceanography
MSc 1982 Stanley C Pillar	External Committee, University of Cape Town

PhD 1980 J. Anthony Koslow                      Committee, UCSD, Scripps Institution of Oceanography  
PhD 1979 Robert J. M. Crawford              External Committee, University of Cape Town

**Technical**

February 1966 Consultant to SCOR, UNESCO, and ICES Working Group 13 and Participant in Symposium on Hydrodynamics of Zooplankton Sampling sponsored by ICES, SCOR and UNESCO, Sydney, Australia

March 1972 - Invited Lecture Department of Biological Sciences, University of York

March and December 1972 Consultant SCOR-ACMRR-UNESCO-IBP/PM Working Group 29 on Monitoring Life in the Ocean, Plymouth, England

November-December 1972 Delegate to U.S.-USSR bilateral meetings on Northeast Pacific Resources, VNIRO, Moscow

May 1973 - Advisor to the California Department of Fish and Game regarding the Carpenter Sardine Management Bill, Senate 192 to impose a moratorium on the directed and incidental catch of the depleted northern stock of Pacific sardines, Sacramento

June 1973 - Participant, Section Chairman and Rapporteur for ICES-FAO-ICNAF Symposium on Acoustic Methods in Fisheries Research, Bergen, Norway

June 1974 Participant on NOAA committee to Design for Marine Environmental Assessments Washington, D. C.

September 1974 Invitation to join SCOR working group 50 on Time series in Biological Oceanography, Plymouth, England

December 1974 Participant El Nino Symposium, Guayaquil, Ecuador

1975-1978 Cooperative research in acoustic resonant frequency applications, Department of the Navy, Naval Ocean Systems Center

August-September 1976 Invited participant Scientific Consultation on the Conservation and Management of Marine Mammals, Bergen, Norway

September 1976 Invited participant Scientific Committee on Oceanic Research (SCOR)/Advisory Committee on Marine Resources Research Symposium on Biological Effects of Ocean Variability, Edinburgh, Scotland

September 1976 Invited Participant Joint Oceanographic Assembly Dynamics of Ecosystems Symposium, Edinburgh, Scotland

February-April 1976 United Nations Food and Agricultural Organization-sponsored consultant to Instituto Nacional de Pesca teaching courses in Ichthyoplankton and Acoustics Surveys, Mexico City, Mexico

1977-1982 Member of International Council of Scientific Unions (ICSU) Scientific Committee on Oceanic Research (SCOR) Working Group 52 on estimation of Micro-Nekton Abundance

January-February 1977 Delegate to Symposium "Studies of marine organisms on the population level" convened by Moiseev of the All-union Research Institute of Marine Fisheries and Oceanography (VNIRO) and chaired by Konovalov of TINRO at Vladivostok Nakhodka, USSR

August 1977 St. Andrews N.B. Workshop participant for Bedford Institute of Oceanography for planning the Scotian Shelf ichthyoplankton surveys, St. Andrews, N.B.

Autumn 1977 Consultant to Underwater Explosions Research Division David W. Taylor Naval Ship Research and Development Center concerning pelagic fish around San Clemente Island

1977-78 Coordinator of the U.S./Mexico Acoustic Subcommittee of the CalCOFI-INP Stock Assessment Committee

March 1978 Invited lecturer Advanced Acoustical Survey course given by the APL of University of Washington

May 1978 - Testimony to California State Assembly on the size of the Anchovy Population Sacramento

June 1978 - Invited Lecturer Course in Zooplankton Sampling at the Centro de Investigacion Cientifica y Educacion Superior de Ensenada

November-December 1978 Symposium participant at the Joint Meeting of the Acoustical Societies of U.S. and Japan, Honolulu

March-April 1979 - Participant Early Life History of Fish Symposium, Woods Hole

May 1979 Invited speaker Washington Sea Grant Lectures on Early Life History, University of Washington

May 1979 - Invited lectures to Sea Fisheries Institute and University of Cape Town, Cape Town, South Africa

September 1979 - NSF Invitation to Sponsored trip to Acoustical Society of America regarding progress in use of Acoustics in Biological Oceanography, Washington D. C.

January 1980 - Organizer and Host, NOAA Ocean Acoustic Remote Sensing Workshop, Seattle

September 1980 - Invited Lecturer to Instituto Polytechnico Nacional CICIMAR-La Paz regarding the relationship between biological oceanography and fisheries management in the Northeast Pacific Ocean, La Paz, Baja California Sur

October-November 1980, July-September 1981, January-February July 1982, March-April 1983  
Deutscher Gesellschaft fur Technische Zusammenarbeit (GTZ) sponsored work with Instituto del Mar del Peru (IMARPE) to train the Peruvian scientific staff to implement new methods of estimating the spawning biomass of the Peruvian anchoveta and sardine, Lima, Pisco, Peru

1981 Consultant to Ecuadorian Instituto Nacional de Pesca regarding the Ichthyoplankton surveys of the Tropical Front Guayaquil, Bahia, Ecuador

April-May 1981 - Consultant to University of California San Diego, Scripps Institution of Oceanography, Marine Physical Laboratory regarding the positioning of a paired array of multifrequency emitters and sensors to detect the passage of schooled pelagic fishes

February 1982 Invited Consultant to Marine Review Committee to review the pre-implementation program to study the effects of the San Onofre Nuclear Generating Station on fishes, Santa Barbara

March 1983 Invited Consultant to Chilean Instituto Fomento de Pesca regarding summarization of existing data from ichthyoplankton surveys and to teach a course in the Southwest Fisheries Center Egg Production Method of Biomass Assessment, Santiago, Valparaiso, Vina del Mar, Dichato and Concepcion, Chile

June 1983 Invited Speaker International Symposium on the Biological Characteristics of Herring and Their Implications for Management in celebration of the 75th anniversary of the Pacific Biological Station, Nanaimo, B. C.

November-December 1983 - Cooperative Research and FAO Consultancy on the comparison of echo-integration and sonar mapping for the survey of *Sardina pilchardus* off Morocco, Casablanca Rome, Morocco

December 1983 - Invited Lectures on the SWFC Egg Production Method and Sonar mapping Ministry of Agriculture, Food and Fisheries Biological Laboratory, Lowestoft, U.K.

1983-1989 - Sardine-Anchovy Recruitment Project Investigator, Principal Investigator 1987-1989  
Lisbon, Vigo Spain, La Jolla

March 1984 - Serve on panel interviewing fishermen regarding the impact of seismic surveying on catch rate of rockfish, Santa Barbara

September 1984 - Invited by University of Washington Institute of Marine Studies to present a review of

oceanographic, biological and fisheries responses to the El Nino phenomenon, Seattle

November 1984 - Meeting with the Egg and Larval Committee on the effects of seismic surveys on survival, Santa Barbara

February 1985 - External examiner PhD thesis Dalhousie University Halifax, Nova Scotia, Ross Shotten

July 1985 - Invited paper at workshop on Biology and Target Acoustics of Marine Life sponsored by the Office of Naval Research at the U. S. Naval Academy, Annapolis

August 1985 - Invited to panel sponsored by California Council for Environmental and Economic Balance for presentation on using research methods to resolve conflicts in seismic oil exploration and the rockfish fishery, Lake Tahoe

May 1986 Ecosystem Keynote Speaker and Symposium organizer at the 10th annual American Fisheries Society Larval Fish Conference, Miami

July 1986 Advisor to Los Angeles County Museum on the prospects of using SWFC Egg Production Methods for the study of sport fishes and other small fish populations, Los Angeles

July 1986 Scientific Advisor to the Joint Panel for mediation of conflicts between oil and fishing industries, Los Angeles

February 1987 - Advise the California Department of Fish and Game and Department of Water Resources on estimation of the Delta striped bass population, Stockton

March-April 1987 - Implement training phase of Spanish-Portuguese SARP with lectures and sea trials Lisbon, Madrid, Vigo, La Coruna

May 1987 - Review statement of work on California Delta Striped bass, Stockton

June 1987 - Invited Lecture regarding the temporal-spatial investigations of schooling, coastal, pelagic fishes - Resource Modelling Association - Vancouver, B. C.

October 1987 - Organized and led a course on Egg Production Methods for Instituto Nacional de Pesca, Mazatlan

October 1987 - Invited participant at Centro Investigacion Biologicas Colloquium on long time series, La Paz

December 1987 - Invited Lecture to National Research Council, Ocean Studies Board regarding the technical mismatch between physical and biological oceanography, Washington D. C.

December 1987 - Review of SARP techniques and data and assist in development of cruise plan from Gibraltar to French border off the Atlantic coasts of Portugal and Spain in Lisbon, Portugal

February 1988 - Review of progress on striped bass population research in the California Delta, Stockton

February 1989 - Review of comprehensive model of striped bass population in the California Delta, Stockton

February 1989 - Invited lecture to Biological Sciences group - University of British Columbia Vancouver, B.C.

September 1989 - Invited Paper to American Fisheries Society Symposium on Fisheries Acoustics, Anchorage

April 1990 - Review Board on dredging of San Francisco Bay and disposition of sediments in the ocean

September 1991 - Participant in GLOBEC West Coast Planning Workshop

January 1992 - Participant GLOBEC NSF Modelling Workshop - Anchovy Model

July 1992 - Testimony to California Legislative Committee on Striped Bass Population Dynamics

September 1992 - MEXUS-Pacifico Participant Sardine Anchovy Populations Manzanillo, Mexico

January 1993 - GLOBEC Steering Committee

March 1994 - Invited Participant "Airborne Fishery Technology" OAR, Boulder Colorado

June 1994 - Invited Participant "GLOBEC International Small Pelagic Fishes and Climate Change" La Paz, Baja California Sur, Mexico

August 1994 - PICES committee on Small Pelagic Fisheries - Growth Meeting

April 1999 IATTC Purse-Seine bycatch working group on ecological studies and modeling.

#### **TITLE OF PH.D. DISSERTATION:**

Reconnaissance of a northern Iowa Sphagnum Bog



## PUBLICATIONS:

78. Gartz, R.G., L.W. Miller, R.W. Fujimura and P.E. Smith. 1999. Measurement of larval striped bass (*Morone saxatilis*) net avoidance using evasion radius estimation to improve estimates of abundance and mortality. J. Plankton Res. 21(3):561-580.
77. Nonacs, P., P.E. Smith, and M. Mangel. 1998. Modeling foraging in the northern anchovy (*Engraulis mordax*): individual behavior can predict school dynamics and population biology. Can. J. Fish. Aquat. Sci. 55:1179-1188.
76. Moser, H.G., N.C.H. Lo, and P.E. Smith. 1997. Vertical distribution of Pacific hake eggs in relation to stage of development and temperature. Calif. Coop. Oceanic Fish. Invest. Rep. 38:120-126.
75. Horne, J.K. and P.E. Smith. 1997. Space and time scales in Pacific hake recruitment processes: latitudinal variation over annual cycles. Calif. Coop. Oceanic Fish. Invest. Rep. 38:90-102.
74. Smith, P.E. 1995. Development of the population biology of the Pacific hake, *Merluccius productus*. Calif. Coop. Oceanic Fish. Invest. Rep. 36:144-152.
73. Smith, P.E. 1995. A warm decade in the southern California Bight. Calif. Coop. Oceanic Fish. Invest. Rep. 36:120-126.
72. Ohman, M.D. and P.E. Smith. 1995. A comparison of zooplankton sampling methods in the CalCOFI time series. Calif. Coop. Oceanic Fish. Invest. Rep. 36:153-158.
71. Lo, N.C.H., P.E. Smith, and J.L. Butler. 1995. Population growth of northern anchovy and Pacific sardine using stage-specific matrix models. Mar. Ecol. Progr. Ser. 127:15-26.
70. Hayward, T.L., D.R. Cayan, P.J.S. Franks, R.J. Lynn, A.W. Mantyla, J.A. McGowan, P.E. Smith, F.B. Schwing, and E.L. Venrick. 1995. The state of the California Current in 1994-1995: a period of transition. Calif. Coop. Oceanic Fish. Invest. Rep. 36:19-39.
69. Lyons, M. L. G., P. E. Smith, and H.G. Moser. 1994. Comparison of cross-shelf trends in Acoustic Doppler Current Profiler Amplitude and Zooplankton Displacement Volume in Southern California. Calif. Coop. Oceanic Fish. Invest. Rep. 35:240-245.
68. Hayward, T.L., A.W. Mantyla, R.J. Lynn, P.E. Smith, and T.K. Chereskin. 1994. The state of the California Current in 1993-1994. Calif. Coop. Oceanic Fish. Invest. Rep. 35:19-35.
67. Nonacs, P., P.E. Smith, A. Bouskila, and B. Luttbeg. 1994. Modeling the behavior of the northern anchovy, *Engraulis mordax*, as a schooling predator exploiting patchy prey. Deep-Sea Research Part II 41(1):147-170.
66. Butler, J.L, Smith P.E, and N.C.H. Lo. 1993. The Effect of Natural Variability of Life-History

Parameters on Anchovy and Sardine Population Growth. Calif. Coop. Oceanic Fish. Invest. Rep. 34:104-111.

65. Moser, H.G. and P. E. Smith. 1993. Larval Fish Assemblages and Oceanic Boundaries. Bull. Mar. Sci. 53:283-289.

64. Moser H.G. and P.E. Smith. 1993. Larval Fish Assemblages of the California Current Region and Their Horizontal and Vertical Distributions Across a Front. Bull. Mar. Sci. 53:645-691.

63. Lo, N.C.H., J.R. Hunter, H.G. Moser, and P. E. Smith. 1993. A Daily Fecundity Reduction Method of Biomass Estimation with Application To Dover Sole, *Microstomus pacificus*. Bull. Mar. Sci. 53:842-863.

62. Smith, P.E. 1993. Balancing Sampling Precision and Fisheries Management Objectives - Minimal Methods. Bull. Mar. Sci. 53:930-935.

61. Smith, P.E., N.C.H. Lo, and J.L. Butler. 1992. Life-Stage Duration and Survival Parameters as Related to Interdecadal Population Variability in Pacific Sardine. Calif. Coop. Oceanic Fish. Invest. Rep. 33:41-49.

60. Lo, N.C.H., J.R. Hunter; H.G. Moser, P.E. Smith; and R.D. Methot. 1992. The Daily Fecundity Reduction Method - a New Procedure for Estimating Adult Fish Biomass. ICES J. Mar. Sci. 49:209-215.

59. Smith, P.E. 1990. Monitoring interannual changes in spawning area of Pacific sardine (*Sardinops sagax*). Calif. Coop. Oceanic Fish. Invest. Rep. 31:145-151.

58. Mangel, M. and P.E. Smith. 1990. Presence-absence sampling for fisheries management. Can. J. Fish Aquat. Sci. 47:1875-1887.

57. Lluch-Belda, D., R.J. M. Crawford, T. Kawasaki, A.D. MacCall, R.H. Parrish, R.A. Schwartzlose, and P.E. Smith. 1989. World-wide fluctuations of sardine and anchovy stocks: the regime problem. S. Afr. J. mar. Sci. 8:195-205.

56. Paul E. Smith, Haydee Santander, and Juergen Alheit. 1989. Comparison of the mortality rates of sardine (*Sardinops sagax*) and anchovy (*Engraulis ringens*) eggs off Peru. Fish. Bull., U.S. 87(3):497-513.

55. Paul E. Smith, Mark D. Ohman, and Laurence E. Eber. 1989. Analysis of the patterns of distribution of zooplankton aggregations from an acoustic doppler current profiler. Calif. Coop. Oceanic Fish. Invest. Rep. 30:88-103.

54. Smith, Paul E. and H. Geoffrey Moser. 1988. CalCOFI time series: An overview of fishes. Calif. Coop. Oceanic Fish. Invest. Rep. 29:66-77.

53. Jahn, Andrew E. and Paul E. Smith. 1987. Effects of sample size and contagion on estimating fish egg abundance. Calif. Coop. Oceanic Fish. Invest. Rep. 28:171-177.
52. Moser, H. Geoffrey, Paul E. Smith, and Lawrence E. Eber. 1987. Larval fish assemblages in the California Current Region, 1954-1960, a period of dynamic environmental change. Calif. Coop. Oceanic Fish. Invest. Rep. 28:97-127.
51. Wolf, Patricia, Paul E. Smith, and Cheryl L. Scannell. 1987. The relative magnitude of the 1986 Pacific sardine spawning biomass off California. Calif. Coop. Oceanic Fish. Invest. Rep. 28:21-26.
50. Wolf, Patricia and Paul E. Smith. 1986. The relative magnitude of the 1985 Pacific sardine biomass off Southern California. Calif. Coop. Oceanic Fish. Invest. Rep. 27:25-31.
49. Smith, Paul E. 1985. A case history of an anti-El Niño to El Niño transition on plankton and nekton distribution and abundances. In: "El Niño North: Niño effects in the eastern subarctic Pacific ocean". ed. Warren S. Wooster and David L. Fluharty. pp 121-142. Washington Sea Grant Program, Univ. of Washington, Seattle, WA 98195 USA.
48. Smith, Paul E., William C. Flerx, and Roger P. Hewitt. 1985. The CalCOFI Vertical Egg Tow (CalVET) net. In: "An egg production method for estimating spawning biomass of pelagic fish: Application to the northern anchovy, *Engraulis mordax*" ed. Reuben Lasker. NOAA Technical Report NMFS 36:27-33.
47. Smith, Paul E. and Roger P. Hewitt. 1985. Sea survey design and analysis for an egg production method of northern anchovy biomass assessment. In: "An egg production method for estimating spawning biomass of pelagic fish: Application to the northern anchovy, *Engraulis mordax*" ed. Reuben Lasker. NOAA Technical Report NMFS 36:17-26.
46. Wolf, Patricia and Paul E. Smith. 1985. An inverse egg production method for determining the relative magnitude of Pacific sardine spawning biomass off California. Calif. Coop. Oceanic Fish. Invest. Rep. 26:130-138.
45. Smith, Paul E. and Roger P. Hewitt. 1985. Anchovy egg dispersal and mortality as inferred from close-interval observations. Calif. Coop. Oceanic Fish. Invest. Rep. 26:97-110.
44. Smith, Paul E. 1985. Year-class strength and survival of O-group clupeoids. Can. J. Fish. Aquat. Sci. 42(Suppl):69-82.
43. Santander, Haydee, Jürgen Alheit, and Paul E. Smith. 1984. Estimacion de la biomasa de la poblacion desovante de anchoveta Peruana *Engraulis ringens* en 1981 por aplicacion del "metodo de produccion de huevos" Bol. Inst. Mar. Peru Callao 8:213-250.

42. Smith, Paul E., Haydee Santander, and Jürgen Alheit. 1983. Comparison of egg sample probability distributions of the anchovy (*Engraulis ringens*) and sardine (*Sardinops sagax*) off Peru and the anchovy (*Engraulis mordax*) and the sardine (*Sardinops caerulea*) off California. In: "Proceedings of the expert consultation to examine changes in abundance and species composition of neritic fish resources" ed. Gary D. Sharp and Jorge Csirke, FAO Fish. Rep. 291, Vol. 3:1027-1038.
41. Smith, Paul E., Haydee Santander, and Jürgen Alheit. 1983. Technical detail of a cruise plan for the anchoveta spawning biomass estimate. Bol. Inst. Mar. Peru Callao 7:25-47.
40. Loeb, Valerie J., Paul E. Smith, and H. Geoffrey Moser. 1983. Recurrent groups of larval fish species in the California Current area. Calif. Coop. Oceanic Fish. Invest. Rep. 24:152-164.
39. Loeb, Valerie J., Paul E. Smith, and H. Geoffrey Moser. 1983. Geographical and seasonal patterns of larval fish species structure in the California Current area, 1975. Calif. Coop. Oceanic Fish. Invest. Rep. 24:032-151.
38. Loeb, Valerie J., Paul E. Smith, and H. Geoffrey Moser. 1983. Ichthyoplankton and zooplankton abundance patterns in the California Current area, 1975. Calif. Coop. Oceanic Fish. Invest. Rep. 24:109-131.
37. Santander, Haydee, Paul E. Smith, and Jürgen Alheit. 1982. Determination of sampling effort required for estimating egg production of anchoveta, off Peru. Bol. Inst. Mar. Peru Callao 7:9-18.
36. Brewer, Gary D. and Paul E. Smith. 1982. Northern anchovy and Pacific sardine spawning off Southern California during 1978-1980: Preliminary observations on the importance of the nearshore coastal region. Calif. Coop. Oceanic Fish. Invest. Rep. 23:160-171.
35. Smith, Paul E., and Richard W. Eppley. 1982. Primary production and the anchovy population in the Southern California Bight: Comparison of time series. Limnol. Oceanog. 27:1-17.
34. Zwiefel, James and Paul E. Smith. 1981. Estimates of abundance and mortality of larval anchovies (1951-1975): Application of a new method. Rapp. P.-v. Reun. Cons. Int. Explor. Mer 178.
33. Smith, Paul E. 1981. Fisheries on Coastal Pelagic Schooling Fish. In "Marine Fish Larvae" ed. by R. Lasker, University of Washington, Sea Grant.
32. Smith, Paul E. 1980. A time series of age composition and apparent abundance of the northern anchovy, *Engraulis mordax*, with inferences about the strength of recruitment. SWFC-LJ-80-07.
31. Smith, Paul E., and Sally L. Richardson. 1979. Selected bibliography on pelagic fish egg and larva surveys. FAO Fisheries Circular No. 706.
30. Smith, Paul E. y Sally L. Richardson. 1979. Tecnicas modelo para prospecciones de huevos y larvas de peces pelagicos. FAO, Documentos Tecnicos de Pesca No. 175.

29. Hewitt, Roger P., and Paul E. Smith. 1979. Seasonal distributions of epipelagic fish schools and fish biomass over portions of the California Current Region. Calif. Coop. Oceanic Fish. Invest. Rep. 20:102-110.
28. Lasker, Reuben and Paul E. Smith. 1979. Estimation of the effects of environmental variations on the eggs and larvae of the northern anchovy. Calif. Coop. Oceanic Fish. Invest. Rep. 19:128-137.
27. Smith, Paul E. 1978. Precision of sonar mapping for pelagic fish assessment in the California Current. J. Cons. Int. Explor. Mer 38(1):33-40.
26. Smith, Paul E. and Reuben Lasker. 1978. Position of larval fish in an ecosystem. Rapp. P.-v. Reun. Cons. Int. Explor. Mer 173:77-84.
25. Smith, Paul E. 1978. Biological effects of ocean variability: time and space scales of biological response. Rapp. P.-v. Reun. Cons. Int. Explor. Mer 173:117-127.
24. Smith, Paul E. 1977. The effects of internal waves on fish school mapping with sonar in the California Current area. Rapp. P.-v. Reun. Cons. Int. Explor. Mer 170:223-231.
23. Smith, Paul E. and Sally Richardson. 1977. Standard techniques for pelagic fish egg and larva surveys. FAO Fish. Tech. Paper 175:100 pp.
22. de la Campa, Sara de Guzman, Martha A. Padilla Garcia, and Paul E. Smith. 1976. Estimaciones de biomasa de reproductores de sardina monterrey (*Sardinops sagax*). A traves de censos larvales. Golfo de California. Temporada 1975. In "Memorias de Simposium sobre Recursos Pesqueros Masivos de México."
21. Hewitt, Roger P., John C. Brown, and Paul E. Smith. 1976. The development and use of sonar mapping for pelagic stock assessment in the California Current area. Fish. Bull., U. S., 74:281-300.
20. Smith, Paul E. 1975. Precision of sonar mapping for pelagic fish assessment in the California Current. J. Cons. Int., Explor. Mer 38:33-40.
19. Smith, Paul E. 1974. Distribution of zooplankton volumes in the California Current Region, 1969. In: CalCOFI Atlas No. 20:xv-xvii, and charts 118-125.
18. Smith, Paul E. 1973. The mortality and dispersal of sardine eggs and larvae. Rapp. P.-v Reun. Cons. Explor. Mer.164:282-292.
17. Kramer, David and Paul E. Smith. 1973. Seasonal and geographic characteristics of fishery resources - California Current Region -- IX. Inshore sportfishes. Mar. Fish. Rev. 35(5-6):15-18.
16. Longhurst, A. R., M. Colebrook, J. Gulland, R. LeBrasseur, C. Lorenzen, and Paul E. Smith. 1972. The instability of ocean populations. New Scient. 1 Jun 72 pp. 2-4.

15. Smith, Paul E. 1972. The increase in spawning biomass of northern anchovy, *Engraulis mordax*. Fish. Bull., U. S., 70:849-874.
14. Kramer, David and Paul E. Smith. 1972. Seasonal and geographic characteristics of fishery resources - California Current Region - VIII. Zooplankton. Commer. Fish. Rev., 34(5-6):33-40.
13. Kramer, David, and Paul E. Smith. 1971. Seasonal and geographic characteristics of fishery resources - California Current Region -- VII. Pacific sardine. Commer. Fish. Rev., 33(10):7-11.
12. Kramer, David and Paul E. Smith. 1971. Seasonal and geographic characteristics of fishery resources - California Current Region -- VI. Rockfish. Commer. Fish. Rev., 33(7-8):40-43.
11. Kramer, David and Paul E. Smith. 1971. Seasonal and geographic characteristics of fishery resources - California Current Region -- V. Northern anchovy. Commer. Fish. Rev., 33(3):33-38.
10. Smith, Paul E. 1971. Distributional Atlas of Zooplankton Volume in the California Current Region, 1951 through 1966. CalCOFI Atlas No. 13.
9. Vrooman, A.M. and P.E. Smith. 1971. Biomass of the subpopulations of northern anchovy *Engraulis mordax* Girard. Calif. Coop. Oceanic Fish. Invest. Rep. 15:49-51.
8. Smith, P. E., E. H. Ahlstrom, and H. D. Casey. 1970. The saury as a latent resource of the California Current. Calif. Coop. Oceanic Fish. Invest. Rep. 14:88-130.
7. Smith, Paul E. 1970. The horizontal dimensions and abundance of fish schools in the upper mixed layer as measured by sonar. In: "Proc. Int. Symp. Biol. Sound Scattering in the Ocean" ed. by B. Farquhar.
6. Kramer, David, and Paul E. Smith. 1970. Seasonal and geographic characteristics of fishery resources - California Current Region -- IV. Pacific mackerel. Commer. Fish. Rev. 32(18):47-49.
5. Kramer, David and Paul E. Smith. 1970. Seasonal and geographic characteristics of fishery resources - California Current Region -- III. Pacific hake. Commer. Fish. Rev., 32(7):41-44.
4. Kramer, David and Paul E. Smith. 1970. Seasonal and geographic characteristics of fishery resources - California Current Region -- II. Pacific saury. Commer. Fish. Rev., 32(6):46-51.
3. Kramer, David and Paul E. Smith. 1970. Seasonal and geographic characteristics of fishery resources - California Current Region --I. Jack Mackerel. Commer. Fish. Rev. 32(5):27-31.
2. Tranter, D. ., and P.E. Smith. 1968. Filtration performance. In "Zooplankton Sampling" Ed. by D. J. Tranter UNESCO Monogr. Oceanogr. Methodol. 2:27-56.
1. Smith, P.E., R. C. Counts, and R. I. Clutter. 1968. Changes in filtering efficiency of plankton nets due to clogging under tow. J. Cons. 32:232-248.